

What is claimed is:

1. A solid state imaging device, comprising:

a solid state imaging element;

5 a timing signal generation circuit which generates an

optical black clock pulse indicating an optical black section and

an enable signal indicating timing at which an output from said

solid state imaging elements stops; and

a clamping means, comprising a target value setting means

10 which sets a target value for output and an amplifier means which

amplifies the difference between said target value and an

optical black signal obtained at a timing of said optical black

clock; and which, along with feeding back said difference value,

matches a signal level of said optical black section outputted

15 from said solid state imaging element to a constant value by

maintaining said target value of said optical black section while

said enable signal outputted from said timing signal generation

circuit is being obtained.

20 2. A solid state imaging device which comprises a clamping

means which matches a signal level of an optical black section

outputted from a solid state imaging element to a constant value,

in which said clamping means comprises:

a first amplifier means which inputs the output of said solid state imaging element at one of its input terminals;

a first sampling means, which includes a switch which goes ON during said optical black section and a retention section, and  
5 which samples the output of said first amplifier means;

a target value setting means which sets a target value for output;

a second amplifier means which receives the output from said first sampling means and said target value level from said target  
10 value setting means via a low pass filter means, amplifies the difference between them, and inputs it to said first amplifier means;

a second sampling means which samples the output of said second amplifier means during a period when an output signal is  
15 obtained from said solid state imaging element;

a third amplifier means which amplifies the difference between an output of said second amplifier means and an output of said second sampling means; and

a switching means which connects an output terminal of said  
20 third amplifier means to said retention section of said first sampling means during a period in which no signal is being outputted from said solid state imaging element, and terminates this connection during a period in which a signal is being

outputted from said solid state imaging element.

3. A solid state imaging device according to claim 2, in  
which said third amplifier means is a differential amplification  
5 device of the open loop type.

4. A solid state imaging device according to claim 2, in  
which said target value setting means comprises:

a D/A converter which converts the data of said target value  
10 to an analog signal; and  
a buffer amp which impedance converts the output of said D/A  
converter.

5. A solid state imaging device which comprises a clamping  
means which matches a signal level of an optical black section  
15 outputted from a solid state imaging element to a constant value,  
in which said clamping means comprises:

a first amplifier means which inputs the output of said  
solid state imaging element at one of its input terminals;  
20 a first sampling means, which includes a switch which goes  
ON during said optical black section and a retention section, and  
which samples the output of said first amplifier means;  
a target value setting means which sets a target value for

output;

a second amplifier means which receives the output from said first sampling means and said target value level from said target value setting means via a low pass filter means, amplifies the difference between them, and inputs it to said first amplifier means;

a second sampling means which samples the output of said second amplifier means during a period when an output signal is obtained from said solid state imaging element;

10 a third amplifier means which amplifies the difference between an output of said second amplifier means and an output of said second sampling means; and

15 a switching means which connects an output terminal of said third amplifier means to said low pass filter during a period in which no signal is being outputted from said solid state imaging element, and terminates this connection during a period in which a signal is being outputted from said solid state imaging element.

20 6. A solid state imaging device according to claim 5, in which said third amplifier means is a differential amplification device of the open loop type.

7. A solid state imaging device according to claim 5, in  
which said target value setting means comprises:

a D/A converter which converts the data of said target value  
to an analog signal; and

5 a buffer amp which impedance converts the output of said D/A  
converter.

8. A solid state imaging device which comprises a solid  
state imaging element, and a clamping means which matches the  
10 signal level of an optical black section outputted from said  
solid state imaging element to a constant value, in which said  
clamping means comprises:

a first amplifier means which inputs the output of said  
solid state imaging element at one of its input terminals;

15 a first sampling means, which includes a retention section,  
and a switch which operates including said optical black section  
outside a vertical blanking period, and which samples the output  
of said first amplifier means;

20 a target value setting means which sets a target value for  
output;

a second amplifier means which receives an output from said  
first sampling means and an target value level from said target  
value setting means via a low pass filter means, amplifies the

difference between them, and inputs it to said first amplifier means;

a second sampling means which samples the output of said second amplifier means during a period in which an output signal  
5 is obtained from said solid state imaging element;

a third amplifier means which amplifies the difference between the output of said second amplifier means and the output of said second sampling means; and

10 a switching means which inputs the output of said third amplifier means to said first sampling means during a period in which no signal is being outputted from said solid state imaging element, and inputs the output of said first amplifier means to said first sampling means during a period in which a signal is being outputted from said solid state imaging element.

15 9. A solid state imaging device according to claim 8, in which said third amplifier means is a differential amplification device of the open loop type.

20 10. A solid state imaging device according to claim 8, in which said target value setting means comprises:

a D/A converter which converts the data of said target value to an analog signal; and

a buffer amp which impedance converts the output of said D/A converter.

11. A solid state imaging device which comprises a solid  
5 state imaging element, and a clamping means which matches the  
signal level of an optical black section outputted from said  
solid state imaging element to a constant value, in which said  
clamping means comprises:

10 a first amplifier means which amplifies the output of said  
solid state imaging element;

15 a first sampling means which samples the output of said  
first amplifier means during said optical black section;  
a target value setting means which sets a target value for  
output;

20 a second amplifier means which receives the output from said  
first sampling means and said target value from said target value  
setting means via a low pass filter means, amplifies the  
difference between them, and outputs its output to said first  
amplifier means; and

25 a switching means which operates during a period in which  
output is being obtained from said solid state imaging element,  
and which changes one of the time constant of said low pass  
filter means and the amplification level of said second amplifier

means.

12. A solid state imaging device according to claim 10, in which:

5        said switching means goes into the OFF state during a period in which a signal is being outputted from said solid state imaging element so as to disconnect a feedback resistor from said second amplifier means, and goes into the ON state during a period in which no signal is being outputted from said solid state imaging element so as to connect said feedback resistor to said second amplifier means; and

10        said first sampling means does not operate during a period in which no signal is outputted from said solid state imaging element.

15        13. A solid state imaging device according to claim 11, in which said target value setting means comprises:

20        a D/A converter which converts the data of said target value to an analog signal; and

25        a buffer amp which impedance converts the output of said D/A converter.

14. A solid state imaging device which comprises a solid

state imaging device, and a clamping means which matches a signal level of an optical black section outputted from said solid state imaging element to a constant value, in which said clamping means comprises:

5           a first amplifier means;

      a first sampling means which samples the output of said first amplifier means at a predetermined timing including the timing of said optical black section;

10          a target value setting means which sets a target value for output;

      a second amplifier means which receives the output from said first sampling means and said target value from said target value setting means via a low pass filter means, and amplifies the difference between them;

15          a second sampling means which samples the output of said optical black section of said solid state imaging element; and a selection means which changes over between the output of said solid state imaging element and the output of said second sampling means;

20          wherein said first amplifier means amplifies a differential value between an output of said second amplifier means and an output of said selection means.

15. A solid state imaging device according to claim 14, in  
which said selection means selects the output of said solid state  
imaging element during a period in which a signal is being  
outputted from said solid state imaging element, and selects an  
5 output of said second sampling means during a period in which no  
signal is being outputted from said solid state imaging element;  
and

    said first sampling means operates periodically except  
    during a vertical blanking period.